

AMENDMENTS TO THE CLAIMS

Claims 1-36 (Previously Canceled).

37. (Currently Amended) Apparatus for impact vibrating treatment of load bearing work product bodies for establishing internal body structural conditions favoring greater strength and longer life, comprising in combination:

a source of repetitive impulse energy,

a transducer adapted to introduce pulse energy from said source by mechanical contact at an external body surface to generate in an interior zone of a solid shaped product body structure corresponding compression wave energy of a magnitude pulse shape and repetition frequency that provides residual plastic deformation of internal body structure having a favorable residual stress pattern in the body structure, said transducer being movable during application of said treatment, and produce in said zone restructured body characteristics presenting reduced structural defects and reduced residual stresses.

38. (Original) Apparatus as defined in Claim 37 for processing a work product comprising a welded body exhibiting a welding seam, further comprising means for positioning said transducer on an external work product surface in a position to treat internal body structure a

zone encompassing an interface between the welding seam and unwelded product body material.

39. (Currently Amended) Apparatus ~~as defined in Claim 37~~ for impact vibrating treatment of load bearing work product bodies for establishing internal body structural conditions favoring greater strength and longer life, comprising in combination:

a source of repetitive impulse energy,

a transducer adapted to introduce pulse energy from said source by mechanical contact at an external body surface to generate in an interior zone of a solid shaped product body structure corresponding compression wave energy of a magnitude pulse shape and repetition frequency that provides residual plastic deformation of internal body structure having a favorable residual stress pattern in the body structure, and produce in said zone restructured body characteristics presenting reduced structural defects and reduced residual stresses,

further comprising welding means for creating a welding seam pattern along an external surface of said product body, wherein the means for positioning said transducer is coordinated to move concurrently along the body surface to follow the creation of said weld seam pattern, thereby further comprising said means for withdrawing said impulse energy from already treated said zones.

40. (Original) Apparatus as defined in Claim 37 further comprising means for deriving from said transducer feedback signals representative of the internal body material state during dynamic changes of state induced inside said product body by said compression wave energy, and means responsive to said feedback signals for modifying the nature of the input energy delivered by said source to the transducer.

41. (Original) Apparatus as defined in Claim 40 wherein said means responsive to feedback signals fashions periodic impulse energy of a frequency, pulse length and phase matching a mechanical resonance frequency of a vibrating transducer at work in contact with the external body surface.

42. (Original) Apparatus defined in Claim 37 wherein the transducer comprises an ultrasonically vibrating transducer mechanism coupled to said external body surface by a wave guide for transmitting wave energy impulses terminating in a contact probe structure for contacting a worn body surface interface.

43. (Original) Apparatus defined in Claim 42 wherein the wave guide comprises a body surface interface adapted to contact difficult to reach areas of treatment of work product bodies in an efficient energy transfer configuration.

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44. (Original) Apparatus as defined in Claim 37 wherein said transducer comprises a peen in contact with said external surface for receiving impact impulse blows at a transducer-peen interface junction.

Claims 45-49 (Previously Canceled).